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ABSTRACT

This paper analyzes responses by 20 high school history teachers to student questions about the beginning of the American Revolution. The teachers viewed a 15-minute videtape on the subject, responded to a series of scripted questions read by student actors, and later reflected in writing on their teaching performance. The teachers varied by gender, race, years of teaching experience, and level of formal education. Videotapes of each administration were analyzed and the written records were studied in an effort to describe the effects of prior teaching experience and formal education on teacher discourse. An analysis of the discourse strategies of the teachers indicated that related to teaching experience were: (1) length of responses; (2) factual content of responses; (3) relating history to students' personal experiences; (4) use of humor; (5) meta-talk on the questions; and (6) follow-up to students. The level of formal education was related to strategies 2 and 3 only. (Author/JD)

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RESPONDING TO STUDENT QUESTIONS: THE EFFECTS OF TEACHER SUBJECT-MATTER KNOWLEDGE AND EXPERIENCE ON TEACHER DISCOURSE STRATEGIES

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ABSTRACT

This paper analyzes responses by 20 high school history teachers to student questions about the beginning of the American Revolution. Data were collected during a field test for research on the development of a national board examination in teaching. The exercise used for this paper required teachers to view a 15-minute videotape, respond to a series of scripted questions read by student actors, and later reflect in writing on their teaching performance. The teachers who served as subjects in the exercise varied by gender, race, years of teaching experience, and level of formal education. Trained examiners administered the exercise, took extensive notes, and assigned rough holistic performance scores for each teacher. The authors later analyzed videotapes of each administration and studied the written records in an effort to describe the effects of prior teaching experience and formal education on teacher discourse.

Discourse analysis in this paper was three-phase. First, responses by four of the teachers (representing extremes of rated performance, education and experience) were studied and six discourse strategies were hypothesized as functions of experience and knowledge. Second, verbatim transcripts of all teacher responses to two of the questions were studied and rated for agreement with the six discourse strategies. Finally, ratings were arrayed on the largely unrelated dimensions of teacher experience and formal education, and agreement with the predicted effects was described.

Related to teaching experience were: 1) length of responses, 2) factual content of responses, 3) relating history to students' personal experiences, 4) use of humor, 5) meta-talk on the questions, and 6) followup to students. Level of education was related to strategies 2 and 3 only.

Responding to Student Questions: The Effects of Teacher Subject-Matter Knowledge and Experience on Teacher Discourse Strategies

To date, most research on classroom questioning has focused on teacher questions. Much of this research has attempted to relate features of teacher questions to student outcomes: usually student achievement or attitudes about the subject-matter (Gall, 1970, 1984; Wilen & Clegg, 1986; Winne, 1979). Research on question wait-time has similarly focused on teacher questions and the effects of wait-time after teacher questions on discrete features of discourse (Rowe, 1974; Tobin, 1987).

Recent sociolinguistic research on classroom language has concentrated less on relating teacher questions to outcome measures and more on describing the role of questions in discourse (e.g., Mehan, 1979). Sociolinguistic approaches to studying classroom language have also focused less exclusively on <u>teacher</u> questions. Mishler (1975), for example, has studied differences in the ways that elementary school students respond to questions asked by teachers and questions asked by other students. He suggests that teachers may use questions as a means of exerting sociolinguistic control in discourse. For example, in Mishler's study, teachers frequently responded to a student question by asking another question. This strategy was rarely used by students.

Recent research by one of the authors of this paper suggests that science teachers may use questions to limit student participation in discourse, and that the extent to which teachers do this may depend in part on their subject-matter knowledge. For example, in one study, discourse

analysis of a number of science lessons taught over one school year showed that teachers asked more questions in lectures and recitations when they were teaching a topic that they understood poorly than when they were teaching a topic that they understood well (Carlsen, 1988). One of the effects of high rates of teacher questioning (in low teacher-knowledge lessons) may be a concomitant decrease in the rate of student questioning (Carlsen, 1987). When science teachers are not knowledgeable about the topic that they are teaching, they may use questions to retain control over speaking turns and discourage students from asking questions. Such a strategy may serve to protect the teacher from revealing ignorance about the subject-matter.

Teachers may use other strategies to reduce the likelihood of publicly being asked difficult questions. For example, when teaching unfamiliar topics, beginning science teachers relied less on direct, whole-class instruction and relied more on small group activities and student seatwork (Carlsen, 1988). Instructional decisions like this present a challenge to the researcher. Instructional context, defined in large part by the teacher, may obscure the effects of subject-matter knowledge. Although teachers may ask more questions in low-knowledge lectures than high-knowledge lectures, they tend <u>not</u> to lecture when teaching low-knowledge topics. As a consequence, determining the effects of subject-matter knowledge on discourse strategies can be quite complicated.

In researching the effects of teacher knowledge on discourse, one way to reduce analytic complexity is to control the context of instruction. For example, by asking teachers with varying subject-matter knowledge to teach the same subject-matter to the same students, it may be possible to

describe teacher discourse strategies associated with high or low levels of teacher knowledge. Obviously, such a strategy is accompanied by some loss of external validity.[1]

This paper describes analysis of data from a controlled teaching exercise. The exercise, experimentally developed as part of a prototype for a national board examination in teaching (Shulman & Sykes, 1986), had 20 high school social studies teachers individually field student questions on topics in American history. Across administrations of the exercise, the context of instruction was held constant in a number of ways, described in the next section. Preliminary analysis of teacher responses was intended to address the following general research questions:

1. Do teacher subject-matter knowledge and teaching experience affect the rate of teacher questioning in a simulated teacher testing environment?

2. Do teacher subject-matter knowledge and teaching experience affect other aspects of teacher discourse?

The Task

Overview. In August, 1987, as part of a research project for a national board examination in teaching, 20 high school social studies teachers participated as subjects in a series of exercises designed to test their knowledge and teaching skills about one period in American history: the years surrounding the founding of the United States. This field test, described in detail elsewhere (Wilson, 1988), also involved approximately 25 other experienced high school history teachers, historians, professors of education and graduate students in education, who served as "examiners." These individuals were responsible for

administering the exercises according to detailed written guidelines, recording the exercises on audio and videotape, and reading instructions to the subjects. Each subject completed each of the ten exercises in the field test over a four day period.

The data analyzed in this paper were collected from one of the exercises in the American history field test.[2] The exercise, entitled "Responding to Student Questions," involved simulation of interactive teaching and focused on teacher responses to student questions. The exercise began with each subject viewing 15 minutes of a commercially prepared videotape on the beginning of the American Revolution. The teacher was then introduced to three high school students and was asked to respond to some questions they had about the videotape. The student queries asked the teacher to answer questions which ranged from typical student misconceptions to difficult historical problems. The final segment of the exercise provided the teachers with a copy of the written script and asked them to reflect in writing on their performance. The entire exercise took about 55 minutes per subject.

Subjects. The 20 subjects were all certified secondary social studies teachers. They varied in teaching experience from 0 years (teachers who had just completed teacher education, including student teaching) to almost 30 years. They also varied in formal education: several had completed only bachelor's degrees (with majors in history, political science or Mexican-American studies); a number additionally had master's degrees in education, history, or another field; and two had other advanced degrees. Teachers for the field test were selected to include variety in formal education and teaching experience, and education and experience

were not strongly correlated. Some of the most experienced teachers had completed no graduate coursework, and some of the least experienced teachers had master's degrees.

The subjects included 13 men and 7 women; 6 identified themselves as minorities. Although the subjects were given pseudonyms which were used throughout the field test and in all aspects of data recording and analysis, we chose one subject at random and omitted him or her from most of our analyses, in an effort to further protect participants' anonymity.[3]

Setting. The history field test was conducted in an elementary school in Stanford, California during summer vacation. The student questioning exercise used three rooms. During the first part of the exercise, subjects viewed a 15 minute videotape segment in a small multipurpose room equipped with chairs, a table, a videocassette player and color monitor, and an audiotape recorder. The second part of the exercise, during which the teacher responded to student questions, was conducted in a classroom equipped with desks, tables, chairs, a blackboard, a videocassette recorder and camera, and an audiotape recorder. The third part of the exercise, during which the subject wrote comments on his or her performance, was conducted in a third room, equipped with tables and chairs. The subject was joined by the examiner during the first and second parts of the exercise, was observed by a varying number of observers during the second part of the exercise (from one to six people, usually other research staff), and completed the third part of the exercise in seclusion.

Student actors. Three student actors, also assigned pseudonyms, were used in this exercise. All three were high school students; none had

previously taken American history. The students -- one boy and two girls -- were provided with detailed scripts and instruction and practice in reading the questions and improvising to a variety of teacher responses. During each administration of the exercise, the examiner sat behind the subject and signalled to the students when to read the next question. The students were paid to participate. The decision to use only three students was a response to the nature of the exercise as a prototype for a teaching examination: including 20 or 30 students in a single exercise of a broadly-administered board examination would probably be prohibitively expensive.

Examiners. Four different examiners conducted the 20 administrations of this exercise. These included one of the authors (Carlsen), who conducted the first administration, and three other examiners who conducted the remaining 19. All four of the examiners were research staff on the field test project; none had significant post-secondary education in American history. However, videotapes of all of the sessions were viewed and analyzed by at least one other person with a background in American history teaching (the other author, Wilson); many were also viewed and described by other observers with research and/or teaching backgrounds in American history.

Each examiner was trained prior to administering the exercise. Training consisted of a one hour training session, observation of at least one other examiner conducting the exercise, and numerous informal conversations. A couple of minor changes were made in the administration of the exercise over the period of the field test; they are unimportant for the present analysis.

Script. The detailed cue sheet and script for the exercise is 13 pages long, and is not included here in its entirety. Discourse analysis in this paper focuses on two questions which we found to be useful in distinguishing expert from inexpert teaching performance: questions number six and seven. These are reproduced below, with the examiner's instructions to the candidate prior to the second part of the exercise. Scripted student questions are italicized:

[The subject has viewed the videotape, met the students, and had a few minutes to talk with them.]

EXAMINER: I would like you all to imagine that after beginning the class with some unrelated activity, you have all just viewed the videotape on the beginning of the American Revolution. There are fifteen minutes left in the class, and these students have some questions. What I would like you to do is field these questions, which for the purpose of this exercise are written in a script. Please handle them as you would student questions in your own class. After fifteen minutes, I will stop you. Any questions? (Pause.)

EXAMINER: I may need to signal the students when to continue on in the script, so I'll be sitting somewhat behind you. You may begin by simply saying, "Well, what did you think?"

[Student actors and the subject go through the first five questions. Question 6 follows:]

6. BRUCE: *I don't understand why the Intolerable Acts were considered so intolerable. If I understood the film right, all the tax laws except the tea tax had been cancelled. The British had spent all this money protecting the colonists from the French and the Indians. How did the colonists expect the King to pay for all that? Why don't we think that the colonists were just a bunch of cowards who had to disguise themselves as Indians before throwing other people's property into the Boston Harbor?*

SANDY: *Oh, come on.*

BRUCE: *No, really. I mean can you imagine President*

Reagan sitting around while a bunch of hoodlums destroyed other people's property?

[After the teacher addressed Question 6, the students were signalled to ask Question 7:]

7. JANET: *What's so revolutionary about the Declaration of Independence? They made a big deal in the film about "life, liberty, and the pursuit of happiness." What's so revolutionary about that? Maybe they ought to just call it a civil war or something.*

These were among the most difficult questions in the exercise; that is why they were included toward the end of the exercise, and that may explain why they were most useful in discriminating teaching performance. Both were complex questions which could be and were answered in a variety of ways. Question 6 could be answered using information contained in the videotape; Question 7 is a more difficult question, definitely requiring additional knowledge about American history. In the analysis which follows, we focus on the relationship between teacher responses to these questions and teacher experience and formal education.

Analysis

A variety of data sources were used in our analysis. First, examiners and trained observers (usually examiners not assigned to that administration of the exercise) took detailed notes during the exercises on extra copies of the script. After a teacher finished the exercise, the examiner and the observers each assigned the teacher a holistic performance score. Few guidelines were provided for determining these scores (they were intended as a very rough metric of teacher performance). Both the examiner notes and the holistic scores were used in minor ways in subsequent analysis.

Four months after the field test, the authors viewed the videotapes in a random sequence, writing detailed notes on each candidate's response to each question, and assigning rough holistic performance scores. During this viewing, the first author focused on teacher discourse strategies and the second author focused on the accuracy of the teacher responses, from historical and pedagogical standpoints. After viewing and discussing all 20 administrations of the exercise, we decided to concentrate discourse analysis on the two questions described earlier in this paper.

Close verbatim transcription of questions 6 and 7 were done for all subjects by the first author, using a modified orthography (Ochs, 1979) which was nonphonetic but preserved characteristic nonstandard speech, such as "um," "OK," and pauses in discourse (see Carlsen, 1987). The duration of each response was included in the transcript.

Information on each teacher's background was summarized from data provided by the teachers. As a measure of teaching experience we used total years of employment as a secondary teacher (for all candidates, most or all of this experience was teaching American history), and coded formal education using the scheme summarized below. The coding scheme is not an interval variable, but simply a summary of subject-matter preparation:

Code	Post-secondary education
1	Bachelor's degree only, in a subject other than history
2	Bachelor's degree in a subject other than history plus master's degree in education
3	Bachelor's degree only, in history
4	Bachelor's degree in history plus master's degree in education
5	Bachelor's degree plus master's degree in history

Two of the twenty subjects did not fit into the above scheme (they held other advanced degrees); we coded them using the categories we felt were most appropriate.

The next stage of analysis was to use the general research questions described earlier and a subset of the data to construct specific hypotheses regarding the effects of teacher knowledge and experience on discourse. To do this, we began by rank-ordering the 20 candidates by mean holistic rating scores (averaged across examiner, observers, and the authors) and comparing this ranking to teacher biographical data. Of the five lowest-scoring candidates, four had 0 or 1 year of teaching experience, and none had any formal education beyond the bachelor's degree. Of the five highest-scoring candidates, all had more than ten years of teaching experience (mean = 18.0 years) and three had advanced degrees. We then chose a four-teacher subset of the data to use in developing our hypotheses. These included two low-ranked teachers with 0-1 year of teaching experience and two high-ranked experienced teachers with master's degrees. Consequently, the teachers in our subsample represented the extremes of education, experience and rated performance.

All of the data associated with these four subjects were reviewed: holistic scores, notes by examiners and observers, notes by the authors, written comments by the subjects made during the third part of the exercise, and verbatim transcripts. Although there were many differences between the four subjects in their responses to student questions, six characteristics of discourse distinguished the two high-ranked teachers from the two low-ranked teachers. These were then expressed as specific research hypotheses. We predicted that the responses of knowledgeable and

experienced teachers would differ in these six characteristic ways from responses of unknowledgeable and inexperienced teachers.

In the last stage of analysis, we studied the verbatim transcripts in random order and evaluated the agreement between our six specific hypotheses and the data for 19 of the 20 teachers.[4] We then summarized the results in two ways, first by teaching experience and second by formal education, and examined the results to determine the relative effects of experience and knowledge.

Results

Early in our analysis, we noted that there did not appear to be a consistent relationship between rates of teacher questioning and other teacher characteristics. Neither formal education, teaching experience, nor average score on the exercise appeared to be related to the number of questions teachers asked in responding to scripted student questions. The least experienced teachers tended to ask fewer questions, but this appeared to be a function of the duration of their responses (discussed later) rather than their rate of questioning (as expressed in questions per minute).

While the possibility of no relationship between teacher knowledge and teacher questioning cannot be discounted, two alternatives should be considered. First, rates of teacher questioning are at least partly a function of the teacher's discourse style; in one study of science teachers, differences in questioning rate between teachers were greater than differences by subject-matter knowledge (Carlsen, 1988). Our sample may have been too small to detect differences with this large source of natural variation. Second, at times the teachers appeared to stop in mid-

question and rephrase their remarks. One even apologized during the exercise for asking a question, noting out loud that this was a student questioning exercise. Evidently, although the instructions asked subjects to respond to questions the way they would in their own classrooms, at least some of the teachers made a conscious effort to avoid asking questions.

Length of teacher responses. In the four-teacher subsample, we noted that the responses of low-ranking teachers to questions 6 and 7 were much shorter than the responses of high-ranking teachers. For example, in response to question 6 (a very complex question on the Intolerable Acts and the Boston Tea Party), one of the two low-ranked teachers responded:

> TEACHER: Put it, put in a synopsis and shorten it a little?
>
> BRUCE: *How did the colonists expect the King to pay?*
>
> TEACHER: Well, by this time, with all the taxes which they had endured, that they were just fed up pretty much with all the taxes that they had, that had been, y'know put on them. And this time, y'know, a lot of media and propaganda had been played into the uh, the colonists, getting them more uh getting ready to rebel. From the British.

The entire response, including the student's reformulation of one part of the question, took 47 seconds. The second low-ranking teacher in the subsample also had a brief response, about one minute in length.

In contrast, the two high-ranking teachers gave lengthy responses to the questions. For example, in response to question 6, one teacher said:

TEACHER: Bruce, that's a heck of a question. I don't know who wrote that one but he should be shot. Let me take part one (laughs, points at board). The first part, uh, confusion of nomenclature or naming these acts. When these acts were passed in 1774 by the British Parliament, they thought of them in Parliament as Coercive Acts, to punish the people of Boston, for the Boston Tea Party. They did this in various ways. They said the Port of Boston is closed until you pay for the tea. And you've been pretty feisty lately so we're going to kind of limit your self government. And uh, just to be sure that you don't get out of hand, we're going to send some British troops in there under General Gage, and he is gonna take control of things and you're going to have to put his redcoat soldiers up in your occupied buildings. Not your barns and outbuildings as was true in earlier laws passed by Parliament, but your own homes. And, the whole thing was to beat the colonists into line. Well, though the Parliament considered them named simply Coercive or Forced Acts, from the point of view of the colonists, these are intolerable. Especially, when at the same time, another law was added to it. A series of coercive acts called the Quebec Act, extended the size of French Canada, down into the Ohio River Valley, guaranteed protection to the Roman Catholic faith, and uh limited self government. And the colonists looked at these Coercive Acts plus the Quebec Act and said, hey wait a minute. They're changing everything. They're clamping down on us, and they're bringing the Roman Catholic religion in here, even though most of us are Protestants and that's not good. They're limiting self-government in the Ohio River Valley. That's intolerable. So they thought of this whole series of acts as Intolerable Acts. Now what was the second part of the?

BRUCE: *Um, how did the colonists expect the king to pay for all that?*

TEACHER: Well, this didn't have to be paid for. If you mean, how they expected the King to pay for his debts, they expected him to pay for his debts with taxing British subjects living in England. And to let them alone. Because, in a way you've hit on a good sensitive issue here because, you see they wanted it both ways. They wanted to be considered loyal British subjects. But at the same time, they didn't want to pay the price for it. Now, if you wonder why that is, my answer is because these are people who for a hundred and fifty years or more, and their ancestors of course, because no one lived for a hundred and fifty years. But an English colonist living here had, stopped feeling like Englishmen, and started feeling like Americans. I mean, they

talked, y'know I'm an Englishman, King George is a great guy. But, I'm not going to pay for it. They wanted to have their cake and eat it too. Is there more?

BRUCE: *Yeah. Here's my final question. Why don't we think that the colonists were just a bunch of cowards who had to disguise themselves as Indians before throwing other people's property into Boston Harbor?*

TEACHER: You could look at it that way. Anyone who puts on a disguise and destroys public, excuse me private property. Whether it's for a good cause or not is, to a certain extent, doing a cowardly thing. But. They thought at that Boston Tea Party in 1773, that they were doing the right thing. Because the law that was passed that allowed that East India Company to sell all that tea, was unfair. You know what it's like when you feel that a rule is unfair. Probably going to check it out and see if there's some way of avoiding it. It's become a very American way of dealing with what we consider unfair rules. Well. Just because they got caught dealing with this unfair law, they got dressed as Mohawk, as Mohawk Indians, got aboard this British ship, and dumped over three hundred and forty two chests, worth seventy five thousand dollars. Today seventy five thousand dollars is a pretty tidy sum of money. Of course in those days it was worth a whole lot more. So I think you can realize why the British government got a, to use today's terminology got PO'd, and decided to do something about it. Hence the Coercive Acts.

This response took almost four minutes. The answer by the other high-ranked teacher in the subsample took three and a half minutes.

On the basis of the responses of our teacher subsample, we hypothesized that formal education and teaching experience were related to the duration of teacher responses to questions 6 and 7. The responses of the other teachers in the sample were inspected to test this hypothesis. We found that the least experienced teachers tended to give the shortest responses (for example, for question 6, responses by all five teachers with 0-1 years of experience were less than the median three minutes long). We did not, however, find progressively longer answers with teach-

ing experience over 2 years.

No consistent relationship was found between the amount and type of formal education and the length of teacher responses, nor was there an interaction effect between teaching experience and formal education.

In summary, compared to experienced teachers, new teachers with 0-1 years of experience provided brief responses to student questions. More experienced teachers provided longer responses, but the length of responses did not increase in a predictable fashion with the number of years of teaching experience.

Factual content. Clearly related to the length of teacher responses is the content of teacher responses. In our four-teacher subsample, the high-ranked teachers talked about a great deal more factual content, bringing in names, dates, points of view, and historical anecdotes where they saw fit. This additional content did not always directly address student questions, however. The responses of one of the two high-ranked teachers were lengthy and informative, but did not always directly address student questions. Instead, the teacher used student questions as an opportunity to talk about some related historical facts or principles. She began to answer the question, then turned to another issue. This strategy was used several times during the exercise. It didn't appear to be an avoidance strategy attributable to a deficiency in teacher knowledge, because her responses to other, related questions clearly indicated that she understood the subject-matter. Rather, she used the exercise to teach students more history than was prompted for by student questions.

In contrast, the two low-ranked teachers brought in very little additional factual content. They answered the questions using little more

than the information provided in the questions (e.g., that the colonists disguised themselves as Indians for the Boston Tea Party), and did not diverge from the focus of the student question to introduce supplemental historical material. One interpretation is that the low-ranked teachers responded to the student questions as a knowledge-testing task and not as an opportunity to teach about American history.

Examples of the difference in factual content between high-ranked and low-ranked teachers can be seen in the passages quoted earlier.

Armed with the prediction that the factual content of teacher responses is a function of experience and formal education, we studied discourse from the other administrations of the exercise. We again found differences between the five teachers with 0-1 year of teaching experience and the more experienced teachers. All novice teachers provided little if any historical information beyond that given in the questions. Most, but not all, of the more experienced teachers talked about important historical events and figures not mentioned in the question.

Formal education also appeared to be related to the likelihood that teachers would introduce new factual content into their responses. Of the six teachers holding a master's degree and at least an undergraduate major in history (education categories 4 and 5, defined earlier), all six introduced new factual content into their responses. More than half of the remaining 13 teachers (categories 1, 2, and 3) introduced little or none.

Relating historical events to personal experiences. The high-ranked teachers in our four-teacher subsample frequently related historical events to students' personal lives. For example, one of the teachers asked Bruce to break his question (#6) into several parts, and then responded to

one part of the reformulated question in the following fashion:

> TEACHER: OK, start with the first.
>
> BRUCE: *Um. Why were the Intolerable Acts considered so intolerable?*
>
> TEACHER: Intolerable. Well, I think the one that caused them the most trouble was, well, I like to talk about the Quartering Act, because it's so easy. All of you live in a house. You have parents. Do you have your own room? Do you have a guest room? Empty? How many of you don't have a guest room? Fine. If we had British soldiers come now, to be boarded, you would be bumped to the couch, and they would live in your room. Alright. It's intrusive. How would you like to have four armed men in your house, and you don't know them? You've never seen them before and they're not your nationality. It's, it was intimidating. They were not very nice sometimes. They had muddy boots. Not nice table manners. They made demands and made a mess of the carpets and you had to constantly clean up after them and serve them. Sometimes, they weren't pleasant. Soldiers are not known, when they're away from home, to altogether as nice as they are when they are at home. Now the next part.

This response, delivered with animation and verbal emphasis, asked the students to relate their own lives with the lives of the colonists, for the purpose of understanding why the Quartering Act was considered intolerable. The two high-ranked teachers frequently asked students to relate their own experiences to the subject-matter. The two low-ranked teachers did not. Therefore we returned to the larger sample of teachers predicting an effect of teacher experience and education on verbal strategies requiring students to relate the subject-matter to their own personal experiences. Our analysis suggests that both teacher variables are related to this discourse strategy.

For example, of the nine least experienced teachers (all had taught six years or less), comments by only two teachers in response to question

6 asked students to relate concepts or events to their personal experiences. In contrast, six of the ten most experienced teachers asked students to do this in detail, and two others did in a less detailed fashion.

In summary, experienced and highly educated teachers in our sample were more likely to explicitly ask students to relate historical events or concepts to their own lives. Obviously, such a strategy can be misused: in understanding history, it may be misleading to interpret historical events from a contemporary perspective. Nevertheless, by making the subject-matter more accessible and personal, this discourse strategy may serve as an invitation for students to ask further questions. Since the questions in this exercise were scripted, that speculation will have to remain a subject for further research.

Humor. In our four-teacher subsample, high-ranked teachers frequently smiled, laughed, or made humorous remarks (e.g., "Bruce, that's a heck of a question. I don't know who wrote that one but he should be shot."). In contrast, although one of the low-ranked teachers smiled pleasantly, neither laughed or used any humor evident to us. In one respect, this is not surprising: after all, these teachers may have realized that they were not performing well! However, humor may serve as a signal to students in discourse that they are welcome to ask questions or make remarks. We therefore returned to the larger sample to test the hypothesis that teacher experience and education is related to the use of humor in discourse.

Although formal education appeared to be unrelated to the use of humor in responding to questions 6 and 7, teaching experience was related to

humor. For example, none of the responses to question 6 by teachers with six years teaching experience or less showed much evidence of humor. About half of the more experienced teachers used humor. We classified responses as using humor if the teacher laughed, told a joke, made an obviously outrageous remark, or made the students laugh (a challenging task when the students have given up part of their summer vacation to ask twenty different teachers the same eight questions). Subtle jokes, puns or other less obvious types of humor were uncommon.

Commenting on the question. Both of the high-ranked teachers in our four-teacher subsample commented on the complexity of question 6. We have already reviewed one of the teacher's remarks (and are happy to report that no one has been shot); here is the other teacher's:

> TEACHER: That is, a nine part question? (laughs) Let's go to part one. I love serial questions, because that indicates a bright, questing mind ... (everyone laughs)

In contrast, neither of the two low-ranked teachers commented on the structure of the question (although one asked the student to shorten it).

This difference suggests two things. First, it suggests that the high-ranked teachers were more comfortable "stepping back" from the demands of the task (answering the student question), and commenting on the aesthetic qualities of the question. Second, it suggests that the high-ranked teachers were more adept at recognizing multiple-part questions.

In the larger sample of teachers, teaching experience appeared to be related to meta-talk about question 6; formal education did not. Only one of the nine least experienced teachers noted out loud the complexity of the question. The others expressed confusion, but tended to request that

the question be repeated or simplified, rather than noting that it had more than one part, each warranting separate treatment. In contrast, most of the more experienced teachers (all having 7+ years of experience) talked about the question, and requested that it be broken into its component parts.

Followup. Related to identification of the complexity of a question is its transformation into component parts and dealing with each of those parts. As noted above, the more experienced teachers were more likely to break question 6 into several questions. A typical strategy, quoted on pages 13-14, was to answer one part of the question, then ask the student to repeat the next part of the question. Our high-ranked teachers tended to signal the end of their answer by asking something like, "Does that answer your question?" Each of these discourse strategies -- asking a student to repeat subsequent parts of the question and asking students to evaluate the teacher's response -- are examples of teacher followup. Followup was most common among experienced teachers. For example, we rated only one of the nine least experienced teachers as using followup in their responses to question 6; most of the more experienced teachers, however, did return to the student who asked the question.

Teachers' formal education appeared to be unrelated to the likelihood that they would followup student questions.

Conclusions

To date, our analysis of data from this simulated teaching exercise has focused on responses to two difficult student questions about American history. We have identified several discourse characteristics related to teacher experience and formal education, including: 1) the length of

teacher responses, 2) the factual content of teacher responses, 3) relating historical events and concepts to students' personal experiences, 4) the use of humor, 5) commenting on the features of student questions, and 6) followup to students.

Each of these six characteristics were more common in the responses of experienced teachers than inexperienced teachers. In some cases (e.g., length of response to a question), teachers with 0-1 years of experience were qualitatively different from all other teachers. In other cases (e.g., followup to students), differences appeared between very experienced teachers (e.g., those who had taught for ten or twenty years) and less experienced teachers.

The effects of formal education were less clear. The most highly educated teachers in our sample tended to give longer responses with more factual content; however, they were not more likely than less educated teachers to use some other discourse strategies.

Our prediction that teacher experience and education would be related to teacher questioning strategies was not supported by this research. Two possible explanations were proposed for this: natural variation in teacher discourse styles and interpretations by some of the teachers that this was a <u>student</u> questioning exercise. Analysis of some of the other exercises from the field test may help us test these alternative explanations.

Although we endeavored to make this exercise similar to a real teaching situation by, for example, conducting it in a classroom and using student actors, we did not intend to directly simulate an actual teaching experience. Rather, we attempted to simulate part of a possible teacher <u>assessment</u>. Consequently, we made some design decisions that would be

unusual in a traditional teaching experiment. For example, during the second part of the exercise, the typical subject shared a regular classroom with three students, several examiners, and a great deal of recording equipment.

A number of important questions are still unanswered, and we hope to address them in the coming months. For example, although we have identified discourse strategies related to teacher experience and education, we have not yet attempted to analyze the relationship between these strategies and the quality of instruction. Obviously, since this exercise was conducted as part of research on teacher assessment, that is an important next step. Nor have we pushed very hard in this analysis on the issue of teacher subject-matter knowledge, beyond categorizing teachers in gross ways (e.g., as having an undergraduate major in history).

We suggest that the discourse strategies used by experienced and knowledgeable teachers in this study would tend to encourage further student questioning. By using humor, asking students to break their questions into several parts, and relating history to students' personal lives, the experienced teachers tried to engage the students in the subject-matter. Such engagement carries a risk for teachers: the possibility that students will ask further questions that the teacher cannot answer.

REFERENCES

Carlsen, W. S. (1987, April). Why do you ask? The effects of science teacher subject-matter knowledge on teacher questioning and classroom discourse. Paper presented at the annual meeting of the American Educational Research Association, Washington, D.C.

Carlsen, W. S. (1988). The effects of science teacher subject-matter knowledge on teacher questioning and classroom discourse. Doctoral dissertation: Stanford University.

Gall, M. D. (1970). The use of questions in teaching. Review of Educational Research, 40, 707-721.

Gall, M. D. (1984). Synthesis of research on teachers' questioning. Educational Leadership, 42(3), 40-47.

Mehan, H. (1979). Learning lessons. Cambridge, MA: Harvard University Press.

Mishler, E. G. (1978). Studies in dialogue and discourse. III. Utterance structure and utterance function in interrogative sequences. Journal of Psycholinguistic Research, 7, 279-305.

Ochs, E. (1979). Transcription as theory. In E. Ochs & B. B. Schieffelen (Eds.), Developmental pragmatics (pp. 43-72). New York: Academic Press.

Rowe, M. B. (1974). Wait-time and rewards as instructional variables, their influence on language, logic, and fate control: Part 1. Wait time. Journal of Research in Science Teaching, 11, 81-94.

Shulman, L. S., & Sykes, G. (1986). A national board for teaching? In search of a bold standard. Paper commissioned for the Task Force on Teaching as a Profession, Carnegie Forum on Education and the Economy.

Tobin, K. G. (1987). The role of wait time in higher cognitive level learning. Review of Educational Research, 57, 69-95.

Wilen, W. W., & Clegg, A. A. (1986). Effective questions and questioning: A research review. Theory and Research in Social Education, 153-161.

Winne, P. H. (1979). Experiments relating teachers' use of higher cognitive questions to student achievement. Review of Educational Research. 49, 13-50.

Wilson, S. M. (1988, April). Preparing for the pedagogical decathlon: Developing assessments for teaching knowledge and skill. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

1. There are other ways of addressing the context-knowledge challenge. One method is to design research studies that simultaneously study teachers' choices of instructional strategies and the structure of classroom discourse. Our experiences suggest that this approach can be very informative but requires the collection of large quantities of diverse data and an insider's perspective on classroom discourse. Consequently, such research is most appropriate for small-N studies (see Carlsen, 1988).

2. A similar field test, focusing on elementary mathematics instruction, was conducted the previous week with different teachers and is largely unrelated to this research.

3. Anonymity of all subjects and examiners in the field test was a condition for participation. We decided to drop one candidate from most of our analysis because in places, our argument describes aspects of teaching which were common to all members of a particular group, for example, teachers with 0-1 years of teaching experience. We do not wish to suggest that our findings are universal to all new teachers, nor even to all new teachers in our study.

4. It was at this point that we dropped one subject from further analysis as a measure of protecting anonymity.